

**REMARKS/ARGUMENTS**

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-15 are pending in the present application. Claims 1-3, 5-7, 9 and 10 have been amended and claims 11-15 have been added by the present amendment.

In the outstanding Office Action, claims 1-10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Eisumu et al., which is respectfully traversed.

Independent claim 1 is directed to a method for extracting a Zernike/Pseudo-Zernike moment basis function for an input image including generating a Zernike/Pseudo-Zernike moment in a predetermined quadrant on plane Cartesian coordinates, obtaining a pixel value of the input image by projecting the input image onto the quadrant, and multiplying each pixel value of the input image by the moment basis function corresponding to the pixel position and then summing the results thereof. Independent claims 6, 9 and 10 include similar features in a varying scope.

Thus, according to the present invention, the Zernike/Pseudo-Zernike moment is exacted by using the symmetry of a Zernike/Pseudo-Zernike moment basis function for the purpose of rapid moment extraction, which decreases memory utilization (see page 2, line 8-11). The Zernike/Pseudo-Zernike basis function with an order of  $n$  and a repetition of  $m$  may be expressed by the mathematical formula (3) noted at page 6, lines 11-14. As known,

the term  $e^{jm\Theta}$  is transformed into  $\cos m\Theta + j \sin m\Theta$  using Fourier equations. The cosine term and the sine term have a specific symmetry in a Cartesian coordinate system (see page 6, lines 19-21). Thus, because the Zernike/Pseudo-Zernike moment basis function is generated in a predetermined quadrant on plain Cartesian coordinates, it is possible to extract a Zernike/Pseudo-Zernike moment using the symmetry of the Zernike/Pseudo-Zernike basis function. Thus, generating the Zernike/Pseudo-Zernike moment basis function in a predetermined quadrant on plain Cartesian coordinates has specific advantages.

The Office Action recognizes Eisumu et al. does not explicitly teach generating a Zernike/Pseudo-Zernike moment in a predetermined quadrant on plain Cartesian coordinates, but indicates this would be an obvious design choice to modify polar coordinates used in Eisumu et al. by replacing it with Cartesian coordinates, since no new or unexpected results are obtained by generating the moments using rectangular (Cartesian) coordinates. However, as noted above, using the claimed Cartesian coordinate system produces specific advantages in which the symmetry of the Zernike/Pseudo-Zernike moment basis function may be used to extract a Zernike/Pseudo-Zernike moment. That is, the cosine term and the sine term have a specific symmetry in the Cartesian coordinate system. Thus, the present invention provides rapid moment extraction, which decreases memory utilization.

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Accordingly, it is respectfully submitted independent claims 1, 6, 9 and 10 and each of the claims depending therefrom are allowable.

Further, new claims 11-15 have been added to set forth the invention in a varying scope and Applicants submit the new claims are supported by the originally filed specification. In particular, new independent claim 11 includes only the generating feature of claim 1 and the specifics of dependent claim 2. It is respectfully submitted the section cited in Eisumu et al. (paragraphs 26-38) in the Office Action does not teach the claimed generating features using a symmetry of a linear function having a slope 1 (see Fig. 3 of the present invention, for example).

In addition, the specification has been amended to correct minor informalities. It is believed no new matter has been added.

### **CONCLUSION**

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **David A. Bilodeau**, at the telephone number listed below.

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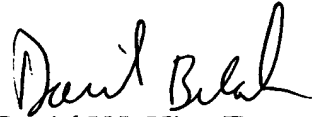
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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,  
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